

ADAPTIVE **RECOGNITION** PORT SYSTEMS

SUBSYSTEM 01 · FIRST-LINE SCREENING

Adaptive Approach Gate

Every vehicle identified before it reaches the gate.

Multi-lane ANPR at the port boundary. Plate, class and speed are read in one free-flow pass, with dimensions from an optional LiDAR, so every truck, car and bus is known while it is still on the approach road.

KNOWN BEFORE THE BOOTH. NOT AT IT.



SCAN TO SEE
IT ONLINE



ALL LANES AT ONCE

Every plate read across every approach lane

99.7%

Plate read and nationality

30-70 KM/H

Free flow, no stop, no tailgating

UNDER A SECOND

From approach to a record in GDS

01 · OVERVIEW

Know every vehicle before the first wheel reaches the gate.

The Adaptive Approach Gate is the first line of the terminal. A multi-lane ANPR gantry at the port boundary reads every approaching vehicle at once, so check-in, freight and deck planning work from facts, not from the queue.

The problem at the boundary

- **The booth is the first time you see the vehicle.** Staff match plates to reservations one car at a time, while the queue grows behind them.
- **Freight surprises the gate crew.** Hazmat, oversize and the wrong vehicle class show up at the booth, not on arrival.
- **Peak sailings outrun the booths.** Check-in throughput follows the manual booth rate, not the sailing schedule.

What the gate does

- **Reads every lane at once.** Front and rear plates with country of registration, day and night.
- **Profiles the vehicle in motion.** Class, make and model, speed and direction. Height, width and length where an optional LiDAR is fitted.
- **Primes the next step.** The record reaches the Globessey Data Server (GDS) while the vehicle is still on the approach road.

99.7%PLATE READ AND
NATIONALITY**98%**

VEHICLE CLASSIFICATION

EUTYPE-APPROVED SPEED
MEASUREMENT (VIDAR
SPEED)**Under 100** msPLATE DECODE BY
CARMEN FREEFLOW

Figures are the delivery KPIs our deployments are contracted to meet, and the engine's published decode time. Actual performance depends on port layout, traffic mix, lane design and the integration on the port's side.

WHO IT IS FOR

01**Ferry terminals**

Identify every vehicle joining the queue, so check-in staff can match plates to reservations before the booth. No idling, no surprises.

02**Ro-Ro ports**

Read trailer plates and hazmat codes on arrival, so freight rolls through gate validation without slowing the convoy.

03**Peak-season surge**

Pre-identify every vehicle in the queue at peak departures, so check-in throughput tracks the sailing schedule.

What it changes for operators

- Check-in and freight lanes primed before the vehicle arrives
- Dangerous goods flagged at the boundary, not at the booth
- Tariff, oversize checks and deck planning fed from measured data

Built on 35+ years of ANPR

Adaptive Recognition has built number plate and vehicle recognition since 1991. The Adaptive Approach Gate is one of six Adaptive Port Systems subsystems that share one data layer, the Globessey Data Server.

02 · CAPABILITIES

Four lenses on every approaching vehicle.

Four streams of data in a single pass. Every truck, car and bus is classified and timed before the gate opens.

01

Multi-lane ANPR

Every licence plate across every lane read at the same time, day and night, at a constant 30 to 70 km/h.

02

Vehicle classification

Trucks, vans, cars, buses and motorcycles told apart automatically, feeding lane logic and tariff systems downstream.

03

Speed on approach

Live speed readings anticipate arrival timing and flag vehicles outside the safe approach envelope.

04 · Option

Dimension capture

An optional third-party LiDAR measures height, width and length in motion, ready for tariff calculation, oversize detection and deck planning.



FIGURE 1 The approach road is where the record starts. Lane signage and gantry by the port.



FIGURE 2 Placards read by Carmen ADR.

Hazmat spotted at the boundary, not at the booth.

Carmen's ADR module reads the orange dangerous-goods placard, hazard number and UN number, and ISO container codes straight off the approaching vehicle. Regulated cargo is identified and routed the moment it enters the approach, so it never surprises the gate crew or holds up the vessel call.

03 · HOW IT WORKS

From approach to record in under a second.

Vehicles keep a constant speed under the gantry. The record lands in GDS while the vehicle is still on the approach road, so downstream subsystems are already primed.

01**Capture**

Vidar ANPR cameras image every plate and vehicle profile from up to 30 m away, across all approach lanes at once.

02**Decode**

Carmen FreeFlow resolves the plate in under 100 ms, with country detection and a confidence score, in rain, glare or at night.

03**Classify and measure**

Vehicle type and speed are derived in the same pass, plus dimensions where LiDAR is fitted, and bundled into one vehicle record.

04**Stream**

The record reaches GDS before the vehicle reaches check-in. Your integrator matches it to the booking or slot.

LANE ANATOMY · TOP VIEW

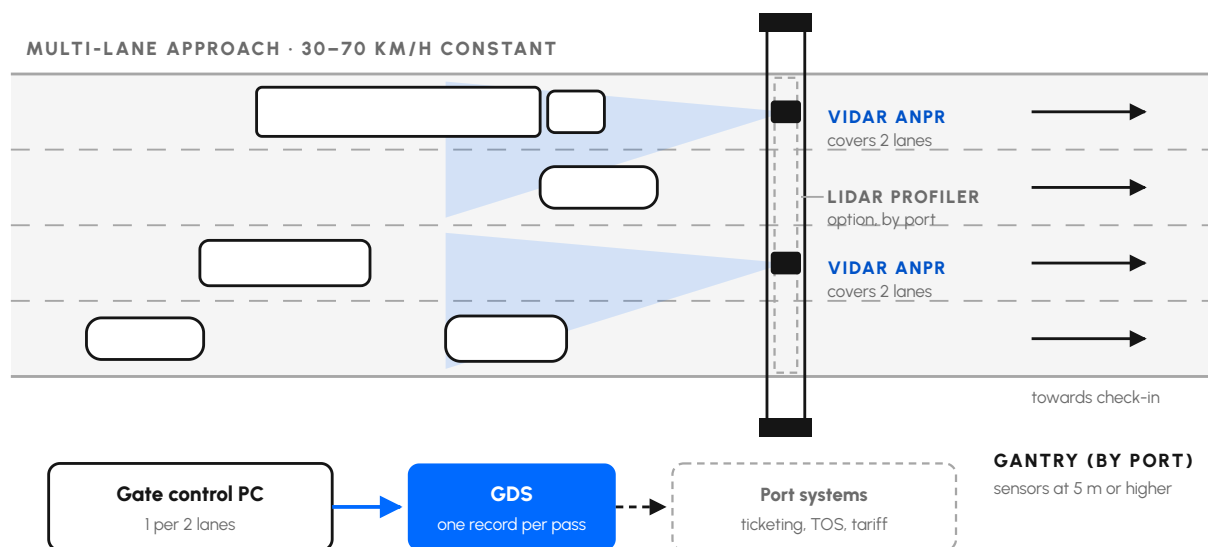


FIGURE 3 Four-lane example: one Vidar ANPR per two lanes on one gantry, run by a gate control PC, with an optional LiDAR profiler. Blue: Adaptive Recognition supply and sensing zone. The gantry, signage and integration into your ticketing system or TOS are provided by the port or its integrator.

Operating envelope

LANES	As many free-flow lanes as the gate needs. Lane widths 2.5–3.75 m
SPEED	30–70 km/h, constant. No stopping, no tailgating
VEHICLE SIZE	0.6–2.6 m wide, 1.5–4.5 m high, 2.2–21.5 m long, measured where LiDAR is fitted
AXLES	Axle loads 400 kg–20 t, up to 99 axles
MOUNTING	Gantry with sensors at 5 m or higher. One gate control PC per 2 lanes
OPTIONS	LiDAR dimensioning and weigh-in-motion (both third-party), OBU/DSRC reader, dual-direction operation with wrong-way alerts

04 · THE RECORD

What every crossing writes to the Globessey Data Server.

One free-flow pass produces one complete, time-stamped event: images, identity, class, geometry and motion. Everything is delivered through documented APIs. Nothing is locked in a proprietary export.

DATA	WHAT IS RECORDED	DELIVERY KPI
Event metadata	Site, lane, event ID, timestamp. The backbone every other field hangs on.	99.5% counting
Number plate	Front and rear plate with country of registration.	99.7% read · 99.7% nationality
Make and model	Manufacturer and model recognised per vehicle.	per event
Vehicle class	Classified into vehicle categories.	98%
Dimensions	Option: height, width and length from a third-party LiDAR in the same pass.	where fitted
Speed and direction	Lane-accurate speed and direction of travel.	type approved
Axle weights	Option: gross weight, per-axle weight and axle spacing from weigh-in-motion.	where fitted
Image evidence	Front and rear overview plus plate close-ups, attached to the event.	every event

KPIs are the acceptance thresholds our deployments are contracted to meet, not lab bests. Vehicles outside the measurement envelope are still recorded. The contracted accuracy figures no longer apply to them. Weigh-in-motion is third-party equipment, procured separately, and many approach gates run without it.

One approach pass, field by field

FRONT PLATE	NL AL-EX-71
REAR PLATE	GB Q74 LTC
MAKE AND MODEL	Scania 164L 420
CATEGORY	Artic truck
DIMENSIONS (OPTION)	255 × 418 × 1650 cm (W × H × L)
SPEED AND DIRECTION	70 km/h inbound, lane 2
DATE AND TIME	2026-08-18 13:48:27
SITE, LANE, EVENT	Gate 01 · lane 2 · event 4471
ADR PLACARD (OPTION)	3YE 1203
AXLE WEIGHTS (OPTION)	26.6 t gross, per axle and spacing

Values show one illustrative event. Fields marked as an option are fitted only where a site asks for them.

We deliver the reading, not the ruling. The record lands in your data layer complete. What happens next, clearing a booking, opening a barrier or raising a tariff, is decided by your own systems.

Where the record goes next

- Your ticketing system or TOS, to match the booking or slot
- Check-in and freight lanes downstream, already primed
- Tariff, oversize checks and deck planning

05 · THE CAMERA AND THE ENGINE

Vidar does the reading. Carmen reads them all.



Vidar is Adaptive Recognition's all-in-one ANPR camera. It images, decodes and classifies vehicles on the move, with the Carmen engine running on board. One device covers up to two lanes, triggers itself and streams finished reads straight to GDS.

100%VEHICLE DETECTION.
SELF-TRIGGERING**2 lanes**

COVERED PER CAMERA

Carmen ANPR and MMR on board

Plate, make, model and country resolved in the camera. No separate recognition server in the loop.

Reads at real traffic speed

Free-flow recognition day or night, on coloured, reflective and non-reflective plates.

Two lanes, one camera

Built-in hardware and software triggers. No external ground loop required.

Serious on-board compute

Two four-core CPUs run video, ANPR, make and model, and data streaming in parallel.

Self-adjusting optics

Gyroscope, accelerometer and laser keep zoom and focus sharp. No manual re-tuning after install.

Built to integrate

A documented API with PUSH and PULL data streams feeds GDS, your TOS or a tolling backend.

CARMEN FREEFLOW

Carmen FreeFlow is the recognition core inside every Adaptive Approach Gate. It reads plates without zones or triggers, in any orientation, and returns make, model and colour alongside the plate.

- **160+ countries, 60,000+ plate types.** Latin, Arabic, Cyrillic and Thai scripts. One library covers mixed international ferry traffic.
- **Make, model and colour.** The vehicle is described, so the record can be matched to the booking and checked for fraud.
- **Dangerous goods and container codes.** ADR plates and ISO container codes read in the same pass.
- **Four engine updates a year.** New plate designs are covered without touching the hardware.



FIGURE 4 One engine for plates from 160+ countries.

06 · HARDWARE

What is in the lane.

A camera, an engine and one gate PC.

Per gantry: one Vidar ANPR for every two lanes, the triggering unit, and one gate control PC for every two lanes. An optional third-party LiDAR adds vehicle dimensions.

**1 PER 2 LANES****Vidar ANPR camera**

All-in-one ANPR camera with the Carmen engine on board, IR illumination and up to five-megapixel imaging. Engineered for outdoor 24/7 operation.

Detection	100% · self-triggering
Speed	30–70 km/h, constant
Coverage	Up to 2 lanes
Compute	Dual 4-core CPUs

Carmen

LICENSED ON BOARD**Carmen FreeFlow**

Adaptive Recognition's ANPR engine. Reads plates without zones or triggers, in any orientation, and adds make, model and colour.

Plate accuracy	95–99%
Coverage	160+ countries
Plate types	60,000+
Platforms	Windows · Linux

**1 PER 2 LANES****Gate control PC**

Rugged, fanless industrial PC that runs the lane. Syncs the trigger and any LiDAR profiler, assembles the event and sends it to GDS.

Role	Lane control, event assembly
Output	GDS event package

Options

- OBU/DSRC reader
- Dual-direction operation with wrong-way alerts
- ADR placard and ISO container code reading

Third-party, procured by the port

- LiDAR profiler for vehicle size and dimensions
- Weigh-in-motion, where the site weighs at all
- Gantry, foundations and civil works
- Traffic-control display, barrier or traffic lamp

GLOBESSEY DATA SERVER

GDS is the data layer under all six Adaptive Port Systems subsystems. It stores every approach event with its images and exposes it through documented APIs and SDKs to your ticketing system, TOS or tolling backend.

- On-premise by default, on your own hardware
- Security posture aligned with NIS2, GDPR and ISO
- The same record primes the Check-In and Freight gates downstream

07 · SCOPE OF SUPPLY

What we deliver, and what stays yours.

We supply the recognition layer: the cameras, the engines that turn a moving vehicle into a record, and the data platform underneath. The lane itself is procured and installed by you or your integrator.

Delivered by Adaptive Recognition

- Vidar ANPR cameras, with the Carmen recognition engine licensed on board
- The triggering unit the lane is designed around
- The industrial gate control PC that runs the lane
- Globessey Data Server, on your own hardware (optional)
- Commissioning, fine-tuning and lifecycle support under one SLA through ARGS

Provided by the port or its integrator

- Gantry, foundations and all civil works
- Electrical cabinet, power supply, cabling and network
- Traffic-control display, barrier or traffic lamp, where the lane needs them
- LiDAR profiler and weigh-in-motion equipment, where the site measures size or weight
- Integration into your ticketing system or TOS

The reading, not the ruling. The record lands in your data layer complete. Clearing a booking, opening a barrier or raising a tariff is decided by your own systems.

COMMON QUESTIONS

Do vehicles have to stop?

No. Reads are guaranteed in free flow from 30 to 70 km/h, with no stopping and no tailgating.

How many lanes can one gate cover?

As many as the approach needs. One Vidar ANPR and one gate control PC cover two lanes each, and all lanes are read at the same time.

What costs accuracy?

Accelerating or braking under the gantry, not the speed itself. Lanes are designed for a constant speed through the gate.

Is weigh-in-motion included?

No. It is a third-party option, procured separately. Many approach gates run without it, and every other measurement still runs.

GET IN TOUCH

See the Adaptive Approach Gate on your approach road.

Book a 30-minute walkthrough with a port engineer. Bring your traffic numbers, and we will scope the right hardware footprint with you.

WHAT TO HAVE READY

Traffic volumes

Peak and off-peak vehicle counts, freight and passenger mix, peak hours.

Site layout

Number of lanes, gate locations, distances between checkpoints, network access.

Existing systems

Booking, ticketing, customs and traffic-management platforms in use.

Your goals

Speed, accuracy, compliance, cost, or all of them.

WHO YOU WILL TALK TO



Péter Tomolák

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Your first point of contact. Péter works with ferry terminals, Ro-Ro ports and integrators across Europe to find where automation pays back fastest.

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This subsystem online

Capabilities and full specifications.
adaptiveportsystems.com/lanes/approach



Book a consultation

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